STATEMENT OF WORK

CUMMINS/ONAN MODEL DQCC 10,000 HOUR BOTTOM END OVERHAUL

1. SCOPE.

This specification contains requirements for the10,000 hour bottom end Overhaul of the number 2, number 3 and number 4 Cummins model DQCC diesel engines. The serial numbers of the engines are as follows: Engine # 2: D120321625, Engine #3: D120325676 and Engine #4: D120326461.

2. REFERENCES.

2.1 Operation and Maintenance Manual QSK23 Series Engines Bulletin Number 4021374

2.2 Cummins Service Manual DQCC Spec A-G

2.3 Operator Manual DQCC Spec A-H

2.4 Industrial Product Test Record Certificate of Test (Attached)

2.5 Test Procedure: Cummins Power Generation (Attached)

3. REQUIREMENTS.

3.1 General. The following requirements apply to all work.

3.1.1 Except as otherwise specified, the contractor shall provide all labor, material, services, tools, supervision, manuals, and technical expertise needed to accomplish the work required by this specification.

3.1.2 All work shall be performed by an authorized repair facility of the engine manufacturer or under the direct on-site supervision of a factory-trained mechanic currently certified by the engine manufacturer. Contractor shall submit evidence of being a Certified Cummins Dealer (A.M.D.) prior to start of work.

3.1.3 All work shall be in accordance with the manufacturer's service, maintenance, and overhaul technical manuals, including all current and applicable amendments and service bulletins. Unless otherwise specified, the contractor shall provide a copy of the applicable manuals, amendments, and service manuals at the job site. All repairs shall be made according to the manufacturer's engine specifications, clearances, tolerances, and procedures.

3.1.4 All parts and labor provided by the contractor shall be fully warranted for six (6) months. Work shall be performed in such a manner that the manufacturer's warranty on parts and labor is not voided.

3.1.5 Provide and install "mandatory renewal" parts and components as required by this specification and other procurement documents. Other parts found to be in need of renewal may be provided by the Government (if available) and installed by the contractor.

3.1.6 All components and parts used in the engines shall be new original equipment manufacturer (OEM) non-surplus components and parts. Prior to installing components or parts, the COR must perform visual and dimensional inspections to verify that the components or parts are acceptable for use.

3.1.7 Interferences shall be removed and reinstalled, as required, at no additional cost to the Government. Contractor is responsible for removing piping to/from the engine, engine heat exchangers, air motors, etc.

3.1.8 Disassemble the engines, components and parts to the extent specified herein and in other procurement documents. Whenever the extent of disassembly is not specified, disassembly shall be to the extent required to perform the required inspections, repairs, and parts renewal.

3.1.9 Thoroughly clean and conduct a thorough visual inspection of all disassembled parts checking for cracks, scoring, chipping, pitting, signs of overheating, excessive wear, signs of distress, and other defects which could affect serviceability of the engine. Ensure all passages and holes are open and clear. Whenever hydraulic, fuel, lube oil, water, or air lines are disconnected, clean the point of disconnection and cap or plug the hoses or pipes and their connection points.

3.1.10 After inspections and tests have been completed and prior to reassembling the components, submit a report of all inspection findings and test results to the COR. Report shall include a record of all measurements and readings taken, as well as recommendations for additional repairs, parts renewals, inspections, or tests needed to ensure continued reliable operation of the engine. Do not proceed with any additional work until authorized by the Contracting Officer Representative.

3.1.11 After the report has been accepted and all additional work has been completed, reassemble and reinstall all components that were previously disassembled or removed. Reinstallation of all components throughout shall be with new gaskets, seals, grommets, and o-rings.

3.1.12 At the end of each work day, clean up all debris incidental to the performance of the required work. Upon completion of all work, clean all worksites to their as-found condition.

3.2 EXECUTION

3.2.1 The contractor shall perform the 10,000 hour bottom-end overhaul on generators 2,3,4 as specified in References 2.1 through 2.5.

3.2.2 Renew the following parts and components on each engine. No remanufactured components/parts are acceptable. Quantities listed are per engine.

Generator 2:

3..2.3 Install bottom bushings, rod pushes.

3.2. 4 Set main bearing and bearing Thrust.

3.2.5 Replace all hoses.

3.2.6 Radiator complete maintenance is to be done.

3.2.7 Provide complete generator maintenance (Kit rectifier, bearings and proper varnish)

3.2.8 Provide new Kit Engine Piston, with its respective piston cooling.

3.2.9 Provide Retainer gear, core cooler. Pump lubricating oil and breather crankcase.

3.2.10 Change Engine Belts.

3.2.11 Install water pump

3.2.12 Check and adjust the fuel timing, reset all tappets and check valve rotators in accordance with Reference 2.1.

3.2.13 All items are to be presented to the COR at the time of the Continuous Machinery Survey inspection.

3.2.14 During reinstallation of all parts, new gaskets, grommets, o-rings, and joints are to be used throughout and all items shall be torque to specifications listed in Reference 2.1. Torque adjustments are to be witnessed by the COR.

3.2.15 Check engine-to-generator alignment. Adjust as required and demonstrate to COR.

Generator 3:

3..2.3 Install bottom bushings, rod pushes.

3.2. 4 Set main bearing and bearing Thrust.

3.2.5 Replace all hoses.

3.2.6 Radiator complete maintenance is to be done.

3.2.7 Provide complete generator maintenance (Kit rectifier, bearings and proper varnish)

3.2.8 Provide new Kit Engine Piston, with its respective piston cooling.

3.2.9 Provide Retainer gear, core cooler. Pump lubricating oil and breather crankcase.

3.2.10 Change Engine Belts.

3.2.11 Replace and reinstall all valve mechanism assemblies in accordance with Reference 2.1 prior to installation

3.2.12 All items are to be presented to the COR at the time of the Continuous Machinery Survey inspection.

3.2.13 During reinstallation of all parts, new gaskets, grommets, o-rings, and joints are to be used throughout and all items shall be torque to specifications listed in Reference 2.1. Torque adjustments are to be witnessed by the COR.

3.2.14 Check engine-to-generator alignment. Adjust as required and demonstrate to COR.

Generator 4:

3..2.3 Install bottom bushings, rod pushes.

3.2. 4 Set main bearing and bearing Thrust.

3.2.5 Replace all hoses.

3.2.6 Radiator complete maintenance is to be done.

3.2.7 Provide complete generator maintenance (Kit rectifier, bearings and proper varnish)

3.2.8 Provide new Kit Engine Piston, with its respective piston cooling.

3.2.9 Provide Retainer gear, core cooler. Pump lubricating oil and breather crankcase.

3.2.10 Change Engine Belts.

3.2.11 Check and adjust the fuel timing, reset all tappets and check valve rotators in accordance with Reference 2.1.

3.2.12 All items are to be presented to the COR at the time of the Continuous Machinery Survey inspection.

3.2.13 During reinstallation of all parts, new gaskets, grommets, o-rings, and joints are to be used throughout and all items shall be torque to specifications listed in Reference 2.1. Torque adjustments are to be witnessed by the COR.

3.2.14 Check engine-to-generator alignment. Adjust as required and demonstrate to COR.

3.3 Electrical.

3.3.1 Test low lube oil pressure and high jacket water temperature safety shutdown devices. Inspect all electrical connections, exhaust pyrometer leads and readouts, wire standoffs and chafing protections installed on the engines and generators. Provide a condition report detailing general conditions found.

3.4 Painting.

3.4.1 The contractor shall restore all disturbed surfaces to standard Cummins paint scheme. Surfaces to be painted shall be free of dirt and grease prior to paint application.

3.5 Testing.

3.5.1 The Contractor shall notify the COR 72 hours prior to each engine/generator units being tested. Test all alarm and shutdown systems prior to starting. Operate engines at no-load until normal no-load operating temperatures are reached, then increase load incrementally up to full load and operate for one hour. When increasing the load, test operate the engines with the buildings load for a period not less eight two hours. Provide technicians to observe operation, verify joints are leak-free, make adjustments, and record teat data. Perform test according to Industrial Product Test record (Certificate of Test) in accordance to Reference 2.4 and 2.5

3.5.2 Temperatures and pressures shall be monitored and compared to manufacturer’s recommended limits. If a temperature or pressure exceeds or falls below manufacturer’s recommended upper or lower limits, testing shall be stopped and the cause determined and corrected before continuing.

3.5.3 Record the following information near the end of the full-load test; provide test instruments as required:

3.5.3.1 cylinder exhaust temperatures

3.5.3.2 lube oil temperatures

3.5.3.3 water temperatures

3.5.3.4 fuel oil pressure

3.5.3.5 lube oil pressure

3.5.3.6 electrical load on generator prime mover

3.5.3.7 turbo outlet air pressure

3.6 Submit a report of all test data collected. Report shall include manufacturer's recommended limits for each parameter measured.

3.7 Final Adjustments and Tune-up.

3.7.1 After satisfactory completion of operational testing, reset valves and accomplish final adjustments and tune-ups as required to provide smooth, efficient, and reliable operation.

3.8 SAFETY

3.8.1 Once awarded the contract the contractor shall develop a safety work plan and follow all applicable United States (OSHA, National Electric Code, NFPA) safety and health regulations and submit it to the COR for approval within 10 days of the notice to proceed. The safety plan must take into account all elements from the SOW.

3.8.2 The contractor shall develop a lock-out and tag-out safety plan for the project and submit it to the COR for approval within 10 days of the notice to proceed.

3.8.3 Training certificates from Cummings for the technician and back up technician must be provided.

3.9 Notes.

3.9.1 All References 2.1 through 2.5 shall be contractor furnished. Reference 2.4 and 2.5 follows this specification as an attachment.

3.9.2 In each instance, the Contractor agrees to continue to provide sufficient personnel to perform requirements of any critical tasks already in operation or scheduled, and shall be guided by the instructions issued by the Contracting Officer Representative. In the event of a site dismissal or closure due to weather, emergency or other circumstances, the contractor is instructed to contact the COR.